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CLAIMS

1. A method for modulating production of a T helper type 2 (Th2)-associated cytokine by a cell comprising contacting the cell with an agent that modulates the expression or activity of a transcription factor that regulates expression of a Th2-associated cytokine gene such that production of the Th2-associated cytokine by a cell is modulated.
2. The method of claim 1, wherein the agent acts intracellularly to modulate the expression or activity of the transcription factor that regulates expression of a Th2-associated cytokine gene.
3. The method of claim 1, wherein the transcription factor is a member of the maf family.
4. The method of claim 3, wherein the transcription factor is c-Maf.
5. The method of claim 1, wherein the Th2-associated cytokine is interleukin-4.
6. The method of claim 1, further comprising contacting the cell with a second agent that modulates the expression or activity of a second transcription factor that contributes to regulating the expression of a Th1- or Th2-associated cytokine gene.
7. The method of claim 6, wherein the second agent modulates the expression or activity of a Nuclear Factor of Activated T cells.
8. The method of claim 1, wherein production of a Th2-associated cytokine by the cell is stimulated.
9. The method of claim 8, wherein the cell is a T helper type 1 (Th1) cell, a B cell or a nonlymphoid cell.
10. The method of claim 8, wherein the agent is a nucleic acid molecule encoding a maf family protein, wherein the nucleic acid molecule is introduced into the cell in a form suitable for expression of the maf family protein in the cell.
11. The method of claim 1, wherein production of a Th2-associated cytokine by the cell is inhibited.
12. The method of claim 11, wherein the cell is a Th2 cell.

13. The method of claim 11, wherein the agent is an intracellular binding molecule.

5 14. The method of claim 1, further comprising administering the cell to a subject to thereby modulate development of T helper type 1 (Th1) or T helper type 2 (Th2) cells in a subject.

10 15. A method for modulating development of T helper type 1 (Th1) or T helper type 2 (Th2) cells in a subject comprising administering to the subject an agent that modulates the activity of a transcription factor that regulates expression of a Th2-associated cytokine gene such that development of Th1 or Th2 cells in the subject is modulated.

15 16. The method of claim 15, wherein the agent acts intracellularly to modulate the expression or activity of the transcription factor that regulates expression of a Th2-associated cytokine gene.

20 17. The method of claim 15, wherein the transcription factor is a member of the maf family.

18. The method of claim 17, wherein the transcription factor is c-Maf.

19. The method of claim 15, wherein the Th2-associated cytokine is interleukin-4.

25 20. The method of claim 15, further comprising administering to the subject a second agent that modulates the expression or activity of a second transcription factor that contributes to regulating the expression of a Th1- or Th2-associated cytokine gene.

30 21. The method of claim 20, wherein the second agent modulates the expression or activity of a Nuclear Factor of Activated T cells.

22. The method of claim 15, wherein production of a Th2-associated cytokine by cells of the subject is stimulated.

35 23. The method of claim 15, wherein production of a Th2-associated cytokine by cells of the subject is inhibited.

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24. A recombinant expression vector comprising a nucleotide sequence encoding a maf family protein operatively linked to regulatory sequences that direct expression of the maf family protein specifically in lymphoid cells.

5 25. The recombinant expression vector of claim 24, wherein the regulatory sequences direct expression of the maf family protein specifically in T cells.

26. The recombinant expression vector of claim 24, wherein the regulatory sequences direct expression of the maf family protein specifically in B cells.

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27. A recombinant expression vector comprising a nucleotide sequence encoding a maf family protein operatively linked to regulatory sequences that direct expression of the maf family protein specifically in hematopoietic stem cells.

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28. A host cell into which a recombinant expression vector encoding a maf family protein has been introduced, wherein the host cell is a lymphoid cell.

29. The host cell of claim 28, which is a T cell.

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30. The host cell of claim 28, which is a B cell.

31. A host cell into which a recombinant expression vector encoding a maf family protein has been introduced, wherein the host cell is a hematopoietic stem cell.

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32. A method for identifying a compound that modulates the expression or activity of a transcription factor that regulates expression of a Th2-associated cytokine gene comprising:

- 30 a) preparing an indicator cell, wherein said indicator cell contains:
i) a recombinant expression vector encoding a transcription factor that regulates expression of a Th2-associated cytokine gene; and
ii) a vector comprising regulatory sequences of the Th2-associated cytokine gene operatively linked a reporter gene;
- 35 b) contacting the indicator cell with a test compound;
c) determining the level of expression of the reporter gene in the indicator cell in the presence of the test compound;
- d) comparing the level of expression of the reporter gene in the indicator cell in the presence of the test compound with the level of expression of the reporter gene in the indicator cell in the absence of the test compound; and

e) identifying a compound that modulates the expression or activity of a transcription factor that regulates expression of a Th2-associated cytokine gene.

33. A method for identifying a protein in a Th2 cell that interacts with c-Maf
5 comprising:

- a) providing a two hybrid assay including a host cell which contains
 - i) a reporter gene operably linked to a transcriptional regulatory sequence;
 - ii) a first chimeric gene which encodes a first fusion protein, said first
10 fusion protein including c-Maf;
 - iii) a library of second chimeric genes which encodes second fusion proteins, the second fusion proteins including proteins derived from Th2 cells;

wherein expression of the reporter gene is sensitive to interactions between the first
15 fusion protein, the second fusion protein and the transcriptional regulatory sequence;

b) determining the level of expression of the reporter gene in the host cell;

and

c) identifying a protein in a Th2 cell that interacts with c-Maf.

34. A method for identifying a compound that modulates the interaction of a
20 c-Maf protein with a maf response element (MARE) of an IL-4 gene regulatory region, comprising:

a) providing a c-Maf protein and a DNA fragment comprising a MARE of an IL-4
gene regulatory region;

25 b) incubating the c-Maf protein and DNA fragment in the presence of a test compound;

c) determining the amount of binding of the c-Maf protein to the DNA fragment in the presence of the test compound;

30 d) comparing the amount of binding of the c-Maf protein to the DNA fragment in the presence of the test compound with the amount of binding of the c-Maf protein to the DNA fragment in the absence of the test compound; and

e) identifying a compound that modulates the interaction of a c-Maf protein with a MARE of an IL-4 gene regulatory region.

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